

REMARKS

Claims 1-56 are pending in the application. Claims 1-5 and 7-56 are rejected.
Claim 6 is objected to.

With this response, claims 1, 25, 28, 29, 31, 33, 34, 36, 37, 38, 39, 45, 46, 47, 51, 52 are amended, claim 32 is canceled, and claims 57 through 66 are added. Claims 1-31 and 33-66 remain pending in the application for consideration.

All rejections except the §102 rejection of claims 1, 2, and 47 over Yamada have been withdrawn.

New grounds of rejection are applied to claims 1-5 and 7-56.

Claim 6 is objected to as containing allowable subject matter.

The three-month shortened statutory period for response is set to expire on February 17, 2004. It is respectfully submitted that this response, filed February 17, 2004, is timely filed.

A payment of \$248.00 is included for the addition of claims 57 through 66. It is believed that no additional fee is necessary in filing this response. However, if a fee is required, please charge Deposit Account No. 50-1775 and notify the undersigned of the same.

Reconsideration and allowance of the claims in light of the following remarks, are respectfully requested.

Support for Amended and Added Claims

Support for the amendment to claim 1, and for added claims 57 and 58, is found in the specification as originally filed, e.g., at page 18, lines 6 through 20.

Support for the amendment to claim 25 can be found in the specification as originally filed, e.g., at original claim 32, now canceled.

Claims 28, 29, 31, 33, and 34 are amended to be consistent on claim 25, as amended, upon which these claims depend.

Support for the amendment to claim 36 can be found in the specification as originally filed, e.g., page 5, line 6.

Support for the amendment to claims 47 and 52 can be found in the specification as originally filed, e.g., at page 21 lines 20-22, discussing ionically conductive salts, as are known and stated to be used in lithium polymer batteries; and at page 24 line 26 through 27, as well as figure 6, together describing a separator material including a solid polymer (i.e., containing an ionically conductive polymer) electrolyte.

Support for added claim 59 can be found in the specification as originally filed. Claim 59 includes the subject matter of original claim 6, which is indicated to be allowable.

Support for added claims 60 and 61 can be found in the specification as originally filed, e.g., at the paragraph bridging pages 18 and 19.

Support for added claim 62 can be found in the specification as originally filed, e.g., at page 23 line 5.

Support for added claim 63 can be found in the specification as originally filed, e.g., at original claim 46.

Support for added claim 64 can be found in the specification as originally filed, e.g., at original claim 27.

Support for added claims 65 and 66 can be found in the specification as originally filed, e.g., at original claim 5.

Other claims, such as claims 39, 45, 46, and 51, are amended for consistency.

Rejection Under 35 U.S.C. 102

Carlson

Claims 1, 5, 7-9, 16-28, 34, 35, and 47-54 are rejected under 35 U.S.C. 102(e) as being anticipated by Carlson (US 6,488,721).

Claims 1 through 5, 7-9, and 16-24

The rejection is overcome by amendment.

Claim 1 has been amended to recite a method that features a substrate selected from the group consisting of a paper substrate, a metallic foil substrate, a release liner, a metal coated paper, and a metal coated polymer, onto which cathode material is coated.

The Carlson reference does not anticipate amended claim 1. The Carlson reference describes coating a material onto a "microporous" material. See, e.g., the Carlson reference at column 12, lines 49-65, discussing inorganic xerogel layers or films, inorganic xerogel layers or films further comprising an organic polymer, and organic polymer layers or films that undergo vesiculation or pore formation upon gas formation. Neither this description, nor the whole of the Carlson description, anticipates the method of amended claim 1, featuring the recited substrates. Thus, the rejection of claim 1 as anticipated by the Carlson reference is overcome. The rejections of claims 2-5, 7-9, and 16-24, dependent on claim 1, are similarly overcome, and it is requested that the rejection of these claims on the cited basis be withdrawn.

Claims 25 through 28, 34, and 35

The rejection of claim 25 is overcome by amendment.

Claim 25 has been amended to feature a method wherein the edge material and cathode material are coated nearly simultaneously.

The subject matter of amended claim 25 is not anticipated by the Carlson reference and the rejection is overcome. The rejections of claims 26, 27, 28, 34, and 35, dependent on claim 25, are similarly overcome and it is requested that the rejections be withdrawn.

Claims 47 through 51

The rejection of claim 47 as anticipated by the Carlson reference is overcome by amendment.

Claim 47 has been amended to feature a method that includes providing a separator layer comprising solid polymer electrolyte, in contact with cathode material.

The subject matter of amended claim 47 is not anticipated by the Carlson reference. The Carlson reference describes microporous separator layers, which, as is known, are distinct from solid polymer electrolytes. (See, e.g., Applicants' disclosure, e.g., at page 24 lines 26 and 27.) The Carlson reference fails to describe a separator that is a solid polymer electrolyte, as featured in amended claim 47, and claim 47 is not

anticipated. Similarly, claims 48 through 51, dependent on claim 47, are not anticipated. It is requested that the rejection of these claims as anticipated by Carlson be withdrawn.

Claims 52 through 54

The rejection of claim 52 as being anticipated by the Carlson reference is overcome by amendment.

Claim 52 has been amended to recite a lithium polymer battery component comprising a separator comprising solid polymer electrolyte. The Carlson reference does not describe solid polymer electrolyte separators, but microporous separators. Amended claim 52, featuring a solid polymer electrolyte, is not anticipated by the Carlson reference. Claims 53 and 54, dependent on claim 52, are also not anticipated. It is requested that the rejection of these claims as anticipated by Carlson be withdrawn.

Lui et al.

Claims 36 and 38 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu et al. (US 6,159,544).

The rejection is overcome by amendment to claim 36.

Claim 36 has been amended to recite a method that features coating one material that is an electrically insulating edge material onto a substrate, and another material that is a cathode material.

The Lui et al. reference discusses coating "two different materials A and B adjacent each other." See the Lui et al. Abstract. The reference specifically describes only three combinations of different solutions A and B that were coated: three sets of two glycerol solutions of different viscosities. See Lui et al., at column 6, lines 5 through 10 and Table 1. These glycerol solutions are neither insulating edge materials nor cathode materials as claimed. The Lui et al. reference also coats polyvinyl alcohol (PVA) solutions (see column 6, lines 48-58) but "both coating liquids had the same properties," and are not believed to constitute both an edge material and a cathode material as recited in claim 36.

The subject matter of amended claim 36, and claim 38 dependent thereon, is not anticipated by the Liu reference, and the rejection is overcome.

Yamada

Claims 1, 2, and 47 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamada (US 5,404,025).

The rejection is traversed or in the alternate is overcome by amendment to claims 1 and 47.

For reasons of record, the subject matter of claims 1, 2, and 47, is novel over the subject matter of the Yamada reference, because the Yamada reference fails to specifically describe a cathode material for an electrochemical cell, as recited.

Additionally, and in the alternative, claims 1, 2, and 47, as presently amended, further distinguish over the Yamada reference.

Claim 1 has been amended to recite a method that features a substrate selected from the group consisting of a paper substrate, a metallic foil substrate, a release liner, a metal coated paper, and a metal coated polymer, onto which cathode material is coated. Claim 1 as amended is not anticipated by the Yamada reference, and the rejection of claim 1, as well as dependent claim 2, should be withdrawn.

Claim 47 has been amended to feature a method that includes providing a separator layer comprising solid polymer electrolyte in contact with cathode material. The subject matter of amended claim 47 is not anticipated by the Liu et al. reference, and the rejection is overcome.

Rejection Under 35 U.S.C. § 103

Song et al. in view of Carlson

Claims 52-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. (US 6,521,382) in view of Carlson.

The rejection is traversed or overcome based on the amendment to claim 52. Reconsideration of claims 52 through 56 is requested in view of the amendment to claim 52.

According to the rejection, the Song et al. reference does not expressly teach that an edge material contacts the edge of the cathode, as recited in claim 52. The rejection asserts, however, that the Carlson reference teaches a battery comprising a polymeric cathode edge material layer (301), and that the invention of original claim 52 would have been obvious because the artisan would be motivated by the disclosure of Carlson to use an edge material in the cathode of Song et al.

Applicants do not agree that the specific features of the disclosure of the Song et al. reference can be summarily combined with the Carlson reference, to necessarily produce a battery that includes an edge material as recited in claim 52. Thus, Applicants reserve the right to challenge the stated basis of the rejection of claims 52 through 56 as described, as being obvious over Song et al. in view of Carlson.

Regardless of the basis of the original rejection, claim 52 has been amended to feature a lithium polymer battery component comprising a separator comprising a solid polymer electrolyte. The Carlson reference does not describe solid polymer electrolyte separators, but microporous separators. A rejection of claim 52 (reciting a separator comprising solid polymer electrolyte) based on Carlson (describing microporous separators) would contradict the description of Carlson. Therefore, claim 52 as amended is believed to be patentable over the cited combination of references. Dependent claims 53 through 56 are believed to be similarly patentable.

Carlson in view of Lui et al.

Claims 2-4, 10-15, 29-33, and 36-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson in view of Liu et al. (US 6, 159,544).

Claims 2 through 4 and 10 through 15

The rejection of claims 2 through 4 and 10 through 15, which depend on claim 1, are traversed, or in the alternative are overcome by amendment to claim 1.

Claim 1 is amended to recite specific substrates that are not described by the Carlson reference. In view of this amendment, the rejection of claims 2 through 4 and 10

through 15, which depend from claim 1, as obvious over Carlson in view of Liu et al., is believed to be moot and should be withdrawn.

Claims 29 through 33

The rejection of claims 29 through 33 is traversed, or alternatively is overcome by amendment.

Amended claim 29 recites coating a cathode material and an edge material onto a substrate using a die coater having first and second continuous slots for coating stripes of edge material and cathode material onto a moving substrate.

The Office action concludes that it would have been obvious to use a die coater of Lui et al. to form a cathode assembly according to Carlson.

Applicants disagree. The Lui et al. reference very generally includes language regarding coating "two different materials A and B adjacent each other." See the Lui et al. Abstract. The reference specifically describes three different combinations of glycerol solutions A and B that were coated -- three sets of two glycerol solutions of different viscosities. See column 6, lines 5 through 10 and Table 1. Surface tensions and densities of the glycerol solutions are also given, as are the different flow rates for each. See column 6, lines 12 through 16 and Table 1. The only other description by Lui et al. of a specific coating material is a polyvinyl alcohol solution. But, the same PVA solution was coated as both of materials A and B: six percent by weight aqueous PVA (see column 6, lines 48-58), and "both [PVA] coating liquids had the same properties" (specifically, viscosity, density, and surface tension).

Claim 29 (as amended) features coating two (different) fluid materials that include a cathode material and an edge material, as these materials are described in Applicants' specification. The edge material recited in claim 29 is a "non-viscoelastic, polymer-containing, electrically insulating, edge material." The cathode and edge materials, having different chemical makeup, are necessarily different fluids (i.e., not identical fluids such as the PVA solutions of the Lui et al. disclosure).

Lui et al. discuss generally coating any materials "A and B," but show only A and B as similar glycerol solutions or the same PVA solution. Even still, the Office action

concludes that it would have been obvious to use the method of Lui et al. to coat battery cathode materials and edge materials, e.g., as recited in claim 29 (wherein the edge material is a non-viscoelastic, polymer-containing, electrically insulating material).

This conclusion is not supported by the cited references and is untenable. The rejection is tantamount to a conclusion that, based on the Lui et al. reference, it would have been obvious -- and consequently not inventive -- to coat any combination of two different materials using a die coater according to Lui et al. But, the Lui et al. reference does not show that any and every material A in combination with any or every different or the same material B can be successfully coated according to its description. To the contrary, even though it generically identifies "liquids A and B," the Lui et al. reference only shows any specificity in coating two different materials, by coating two glycerol solutions having different viscosities. The reference does not contain any language that appears to teach or suggest how the method could be applied to any or all other combinations of different fluids, such as a polymer-containing edge material and a chemically different cathode material.

While the Lui et al. reference also coats a polyvinyl alcohol (PVA) solution (see column 6, lines 48-58) "both coating liquids had the same properties" (specifically, viscosity, density, and surface tension). Thus, even this portion of the Lui et al. reference fails to suggest that an edge material and a cathode material, as described in the pending application, can be successfully coated according to the Lui et al. disclosure.

While the secondary reference, Carlson, describes coated materials that differ from the Lui et al. glycerol solutions, neither the Carlson nor the Lui et al. reference includes a suggestion that battery materials such as cathode and edge material (e.g., electrically insulating polymer-containing edge material) can be successfully coated as described by Lui et al. The Lui et al. reference, in its description of coating different glycerol solutions or two of the same PVA solutions, fails to specifically suggest methods of coating battery materials such as those recited in claim 29. The Carlson reference, in failing to describe simultaneous coating methods, fails to suggest the specific simultaneous coating method of claim 29.

The Office action asserts that one of skill would have been motivated to use the die coater of Lui et al. to form the cathode assembly of Carlson, because Lui et al. teaches an object of providing "distinct interfaces" between stripes. Applicants do not concede that a suggestion of the subject matter of claim 29 has been established to be present within the cited prior art. Regardless, the general object of Lui et al., of providing "distinct interfaces" between stripes, cited in the Office action, does not amount to a complete description of how such a result can be accomplished with all or various types of coating materials A and B, such as the combination of battery materials recited in claim 29.

Prima facie obviousness requires that (in addition to a suggestion to combine references) upon combining separate subject matter, one of skill also has a reasonable expectation of succeeding with that combination. The Office action does not include an explanation of how one of skill would have reasonably expected that the method of the Lui et al. reference, described in detail only for glycerol solutions and a single PVA solution, could be successfully applied to battery components such as those of claim 29. Thus, a *prima facie* showing of obviousness has not yet been established for the subject matter of claim 29.

Claims 36 through 38

A *prima facie* case of obviousness also has not been established for any of claims 36 through 38, as these claims are amended.

Amended claim 36 recites a coating method that includes coating cathode material and edge material from first and second slots of the same die coater.

As discussed above, the Lui et al. reference, in its description of coating different glycerol solutions of the same PVA solution, fails to specifically suggest methods of coating different battery materials such as a cathode material and edge material, e.g., as recited in amended claim 36. The Carlson reference, in failing to describe simultaneous coating methods, fails to suggest the specific simultaneous coating method of amended claim 36, involving the recited die coater.

The Office action asserts that one of skill would have been motivated to use the die coater of Lui et al. to form a cathode assembly of Carlson, because Lui et al. teaches an object of providing "distinct interfaces" between stripes. Even if this were a sufficient suggestion to arrive at the subject matter of amended claim 36, which is not conceded, the Office action also does not contain reasoning as to how or why one of skill would have reasonably expected that the method of the Lui et al. reference could be successfully applied to battery components such as a cathode material and an edge material, as featured in amended claim 36. Thus, a *prima facie* showing of obviousness has not yet been established for the subject matter of amended claim 36.

Claims 39 through 46

A *prima facie* case of obviousness also has not been established for any of claims 39 through 46.

Claim 39 recites a method for preparing a battery cathode. The method includes coating cathode material and edge material from first and second slots of the same die coater.

The Lui et al. reference fails to specifically suggest methods of coating different battery materials such as a cathode material and edge material, as claimed. The Carlson reference fails to suggest the specific type of simultaneous coating method recited in claim 39, e.g., involving a die coater having first and second slots.

The Office action asserts that one of skill would have been motivated to use the die coater of Lui et al. to form the cathode assembly of Carlson, because Lui et al. teaches an object of providing "distinct interfaces" between stripes. Even if this were to establish a suggestion toward the subject matter of claim 39, which is not conceded, the Office action still does not explain how one of skill would have reasonably expected that the method of the Lui et al. reference could be applied to different battery components such as the cathode material and edge material of claim 36. Thus, a *prima facie* showing of obviousness has not yet been established for the subject matter of claim 39, or, consequently, for any of claims 40 through 46, which depend from claim 39.

Allowable Subject Matter

Applicants acknowledge with appreciation the Examiner's indication that claim 6 is allowable if rewritten in independent form.

Added claim 59 includes the subject matter of original claim 6, and is believed to be allowable.

Conclusion

Reconsideration and allowance of the claims, in view of the above amendments and remarks, are respectfully requested.

The Examiner is invited to contact the undersigned, at the Examiner's convenience, should the Examiner have any questions regarding this communication or the present patent application.

Respectfully Submitted,

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